REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-21 are presently active in this case.

In the outstanding Official Action, Claims 1-17, 20, and 21 were rejected under 35 U.S.C. 103(a) as being unpatentable over Breuer et al. (U.S. Patent No. 5,101,554) in view of Fujii et al. (U.S. Patent No. 5,987,973). Claims 18 and 19 were rejected under 35 U.S.C. 103(a) as being unpatentable over Breuer et al. in view of Fujii et al. and further in view of Cooper (U.S. Patent No. 4,512,441). For the reasons discussed below, the Applicants traverse and request the withdrawal of the obviousness rejections.

The basic requirements for establishing a *prima facie* case of obviousness as set forth in MPEP 2143 include (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, (2) there must be a reasonable expectation of success, and (3) the reference (or references when combined) must teach or suggest all of the claim limitations. The Applicants submit that a *prima facie* case of obviousness cannot be established in the present case because (1) the references, either when taken singularly or in combination, do not teach or suggest all of the claim limitations, and (2) there is no suggestion or motivation to modify or combine the references to arrive at the presently claimed invention.

Claims 1 and 20 of the present application recite a camshaft comprising a support shaft carrying in a region of one end thereof a camshaft element for co-rotation therewith, where the support shaft is configured to capture the camshaft element thereon by a head of a rivet formed of a plastically deformed portion of the end of the support shaft that extends radially outward beyond a sidewall defining an opening in the camshaft element through which the end of the support shaft is configured to be disposed. Claim 15 recites a method of producing a camshaft for an engine, the method including (a) providing a support shaft having an end portion adapted to support a camshaft element, (b) providing on said end portion a camshaft element for co-rotation with said support shaft, and (c) capturing said camshaft element onto said support shaft by plastically deforming a deformation zone of said end portion into a radially extending rivet head that extends radially outward beyond a sidewall defining an opening in the camshaft element through which the end of the support shaft is configured to be disposed. The Applicants submit that the Breuer et al. and Fujii et al. references, either when taken singularly or in combination, do not teach or suggest all of the above claim limitations.

At the outset, the Applicants submit that the combination of the Breuer et al. reference and the Fujii et al. reference fails to establish a *prima facie* case of obviousness for the same reasons as the combination of the Swars reference and the Fujii et al. reference as discussed in detail in the Amendment After Final filed on August 7, 2006.

The Breuer et al. reference is cited for the teaching of a support shaft that includes a head of a rivet formed from plastic deformation of the support shaft. The Official Action

indicates that Figure 1c depicts such a structure. Additionally, the Official Action indicates on page 3, lines 4-6, that Figure 1b depicts a rivet head that is formed from a deformation zone that "overhangs" the camshaft element when the camshaft element is in place. To the contrary, lines 7-9 of page 3 of the Official Action then indicates that the Breuer et al. reference fails to disclose a deformation zone that overhangs the camshaft element when the camshaft element is in place. The Applicants request a clarification of these seemingly inconsistent statements if the rejection is maintained in a future Official Action.

Firstly, the Applicants submit that the Breuer et al. reference does not disclose a head of a rivet, as claimed. The Breuer et al. reference describes the connection of slid-on elements to a hollow shaft by sliding the elements onto the hollow shaft and hydraulically expanding the shaft tube. In the expanding step, an axially extending portion of the shaft tube is plastically deformed and the slid-on element is predominately elastically deformed. No structure is disclosed in the Breuer et al. reference that can be read on the limitation of "a head of a rivet."

The Breuer et al. reference also fails to disclose a head of a rivet formed *at the end* of the support shaft, as recited in the claim. The deformation described in the Breuer et al. reference is not at the end of the shaft tube (1). And, in fact, it is unclear whether hydraulic expansion as described in the Breuer et al. reference can be used to deform an end of the hollow shaft, since such hydraulic expansion requires that two opposing sealing surfaces be placed within the tube in order to provide a sealed chamber in which the hydraulic pressure can increase to cause the deformation. Such a sealed chamber would be difficult, if not

impossible, to form using an end of the shaft, since the end would deform under hydraulic pressure and the seal at that end would quickly be lost.

Furthermore, the Breuer et al. reference fails to disclose a head of a rivet that extends *radially* outward beyond a sidewall defining an opening in the camshaft element through which the end of the support shaft is configured to be disposed, as recited in the claims. The plastically deformed portion of the shaft tube (1) in the Breuer et al. reference does not extend *radially* outward beyond the sidewall defining the opening in the slid-on elements (2, 2a, or 2b), as is evident from a review of Figures 1a, 1b, and 1c. Figure 1b depicts the shaft tube (1) and the slid-on element (2) in both the undeformed state (in dashed lines) and in the deformed state (in solid lines). There is no position at which any portion of the shaft tube (1) extends *radially* outward beyond the inner surface of the hole in the slid-on element (2), but rather the outer surface of the shaft tube (1) and the inner surface of the hole of the slid-on element remain flush in the deformed state, as can be seen in Figure 1c. In fact, the Breuer et al. reference expressly and repeatedly discusses the fact that the process described therein prevents bulging of the tube, which might otherwise cause the wall of the shaft tube (1) to deform to a location that is radially outward of the inner surface of a hole in the slid-on element. (See, e.g., column 2, line 65, through column 3, line 8.) Thus, the Breuer et al. reference not only fails to disclose a head of a rivet that extends *radially* outward beyond a sidewall defining an opening in the camshaft element through which the end of the support shaft is configured to be disposed, as recited in the claims, but also teaches away from such a

feature by teaching a process that is specifically intended to prevent any radially outward bulging.

The Applicants submit that the Fujii et al. reference does not supplement the deficiencies in the teachings of the Breuer et al. reference noted above.

The Fujii et al. reference describes camshafts (6i, 6e), respective thrust control members (32i, 32e), and bolts (35, 35). The bolts (35, 35) are threadedly engaged to ends of the camshafts (6i, 6e). The Applicants note that the bolts (35, 35) are not part of the camshafts, but rather they are separate features that are threadedly engaged to the camshafts. The bolts (35, 35) are thus not a rivet, as claimed. The bolts (35, 35) are clearly not formed of a plastically deformed portion of the camshafts. The Applicants note that these features are structural features, and not simply product by process features, and that these structural features distinguish the claimed invention over the cited art. The Official Action suggests that one of ordinary skill in the art would have been motivated to form the structure of the bolts (35, 35) using the methods taught in the Breuer et al. reference. However, there is no teaching in either reference of a motivation to do so, and in fact, as discussed above, it is unclear whether hydraulic expansion as described in the Breuer et al. reference can be used to form a structure similar to the bolts (35, 35) in the Fujii et al. reference, since it is unclear whether such a hydraulic expansion method can be used at the end of the camshaft due to the difficulties in creating the hydraulic pressure needed when working on the end of the shaft. Furthermore, the Breuer et al. reference expressly teaches against the outward bulging of the

tube shaft such that it bulges radially outward of the inner surface of the hole through the slid-on elements.

Thus, the Fujii et al. reference fails to disclose a head of a rivet formed at the end of the camshaft. The Fujii et al. reference does not disclose any such feature formed from a plastically deformed portion at the end of a shaft, as recited in the claims of the present application. Furthermore, the Fujii et al. reference fails to disclose a head of a rivet that is formed from a plastically deformed portion that extends radially outward beyond a sidewall defining an opening in the camshaft element through which the end of the support shaft is configured to be disposed, as recited in the claims. To the contrary, the Fujii et al. describes the use of a separate feature (i.e. bolt 35) that is threadedly engaged to an end of the camshaft, which is clearly distinct from the claimed features of the present invention.

Thus, the Applicants respectfully submit that the rejection is based on the improper application of hindsight considerations. It is well settled that it is impermissible simply to engage in hindsight reconstruction of the claimed invention, using Applicant's structure as a template and selecting elements from the references to fill in the gaps.

Accordingly, the Applicants submit that a *prima facie* case of obviousness has not been established with respect to independent Claims 1, 15, and 20. Thus, the Applicants respectfully request the withdrawal of the obviousness rejection of Claims 1, 15, and 20.

The dependent claims are considered allowable for the reasons advanced for the independent claim from which they depend. These claims are further considered allowable as they recite other features of the invention that are neither disclosed nor suggested by the

applied references when those features are considered within the context of their respective independent claim.

Consequently, in view of the above discussion, it is respectfully submitted that the present application is in condition for formal allowance and an early and favorable reconsideration of this application is therefore requested.

Respectfully Submitted,

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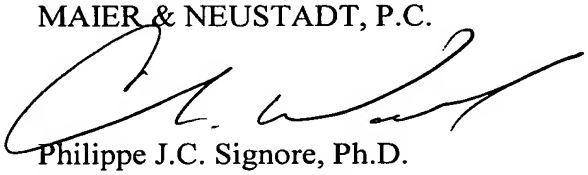

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